

EXHIBIT G - Sierra Lab Report

TITLE:

Evaluations (Efficacy) of Bell + Howell Ultrasonic Pest Repeller model # 50167 Against
Naturalized Populations of House Mouse, *Mus musculus*
Located in Urban Field Sites in Central California.

PERFORMING LABORATORY:

Sierra Research Laboratories, Inc.
P.O. Box 576886
5100 Parker Road
Modesto, CA 95357

STUDY SPONSOR:

Bursor & Fisher, P.A.
888 Seventh Ave.
New York, NY 10019

LABORATORY PROJECT I.D. NUMBER:

SRL Project I.D. # DCP17-1

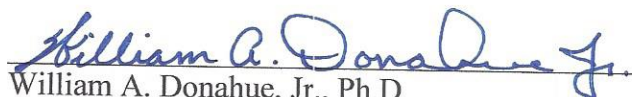
STUDY COMPLETION DATE:

27 October 2017

REPORT AUTHOR:

William A. Donahue, Jr., Ph.D.

The data presented in the final report represent an accurate record of the raw data and the experimental findings.



William A. Donahue, Jr., Ph.D.
Sierra Research Laboratories, Inc.
Study Director & Report Author

27 October 2017
Date

Study Title:

Evaluations (Efficacy) of Bell + Howell Ultrasonic Pest Repeller model # 50167 Against Naturalized Populations of House Mouse, *Mus musculus* Located in Urban Field Sites in Central California.

Objective:

To evaluate the efficacy of Bell + Howell Ultrasonic Pest Repeller model # 50167 against naturalized populations of the house mouse, *Mus musculus* in urban apartments located in central California.

Introduction & Rationale:

Bell and Howell ultrasonic manufactures claim their Bell + Howell Ultrasonic Pest Repeller model # 50167 upon "being plugged in, will drive pests out". This is an important and impactful claim in keeping residential homes free of mice (and other vermin). According to the manufacturer, the length of time it might take pests to leave a premise can vary from days to weeks. These evaluations were conducted to evaluate the efficacy of the Bell + Howell Ultrasonic Pest Repeller against house mice in vacant apartments under simulated home conditions.

Project Personnel:

William A. Donahue, Jr., Ph.D. – SRL Principal Investigator
Michael Donahue, B.S. – SRL Scientist I – Treatments, Data Collection/Analysis
Bret Vinson, B.S. – SRL Scientist I – Treatments, Data Collection
Nick Tobin, A.S. – SRL Intern – Data Collection

Experimental Start Date: October 11, 2017

Experimental Termination Date: October 25, 2017

Test Product:

Bell + Howell Ultrasonic Pest Repeller model # 50167, three (3) 4-Packs, Ordered from Amazon.Com and shipped from Prime Value, Inc. directly to Sierra Research Laboratories. Each unit was tested prior to installation in the test apartments to ensure they were operational (indicator light flashing).

Test Sites and Test Group Assignments:

Six (6) vacant apartments located at 620 Paradise Road, Modesto, CA. The apartments were divided into two groups of three apartments: Untreated Controls (no repellents) U-205 (2 bdr), T-106 (2 bdr), M-103 (1 bdr) and Treated (B&H Repellers) T-102 (2 bdr), B-104 (1 bdr), B-108 (2 bdr). Utilities (electricity) remained on for the duration of the evaluations. The test groups were balance to have two 2-bedroom apartments and one 1-

bedroom apartment for both the treated and control groups. The apartments were provided to SRL by the management to conduct this study, no other treatments or activities were conducted in these units throughout the 2-week evaluation.

Identification of Test Animals:

Wild house mice, *Mus musculus* were collected from a commercial poultry facility by removing them from T-bait tubes (bait removed) and brought back to the laboratory for acclimation. Mice were group housed in small laboratory rodent cages supplied with bedding (wood shavings), commercial rodent diet and fresh water. Mice were observed for health and unhealthy mice were removed from the lab colony. Several age classes were represented in the collections and a mixed sex ratio was observed, but not quantified. Mice were acclimated at the laboratory for approximately 1-2-weeks before being taken to the apartments.

Pre-Treatment Procedures:

Each of the apartments was modified for these evaluations to minimize escape from each unit. Kitchen and bathroom areas had Masonite™ panels installed to keep mice out of cabinets with plumbing fixtures and appliances since the pipes, drains, electrical and clean-outs are shared by adjoining apartments. A barrier panel was also placed around the front door to prevent escapes when the exterior doors were opened for the census counts each day.

Four harborage units were placed into each apartment, two in the front of the apartment and two in the back bedroom. The harborage units were constructed of new clean rodent bait stations (Multiplex) covered by an inverted cardboard box with holes cut in two of the four sides so mice could enter the box and the “mouse stations”. The bait boxes served as nesting or harborage sites because they are designed to give mice a “safe feeding environment” and mice readily utilize these stations. Wood shavings and cotton balls were provided as bedding and nesting materials for the mice to utilize as they would naturally. Three (3) plastic dishes (8 oz. deli dishes) of food (cat chow and rodent chow) and one dish of fresh water was placed into the front room of each of the six apartments and refilled as necessary. The hallway down to the bedrooms was blocked off during the pre-treatment phase so that mice acclimated to front rooms of each apartment.

Twelve (12) mice were released into the front room of each apartment after all the test modifications were made by SRL personnel. Two trail cameras were set on the floor of each of the test units, one positioned to capture images in the front room and the second camera was located in the back bedroom to capture images after the pre-treatment phase was complete and the repeller evaluations began. The pre-treatment acclimation period was 1-week and the six apartments were checked every day for mouse activity, food, water and harborage conditions.

Treatments:

Two (2) Bell + Howell Ultrasonic Pest Repellers were plugged into the wall sockets in the front room of each treated apartment. The units were checked for operation as indicated by the flashing red light on each unit. The units were turned on mid-afternoon on test day 0 to start the efficacy evaluation within the units. The exclusion panel was removed from the hallway to allow the mice free access of the entire apartment as modified. The trail cameras were activated at the same time to record mouse movement and activities during the 14-day evaluation period. See Figures 1 and 2 for floor plans and test site features of the 3 test apartments and the 3 control apartments. The back-bedroom doors were cracked open approximately 1" to allow access to the "escape area" with the two mouse harborage stations as harborage.

Post-treatment Assessments:

Mouse locations were monitored visually by SRL Staff in each test unit twice a day for 14 days. Mouse counts were conducted in each apartment for all four bait box locations both front and back rooms. The locking tabs were removed from each bait box to make visual observations less intrusive to the mice and the cardboard box provided an extra harborage covering the "mouse stations". Mouse locations were also noted for mice not in the stations, but freely moving or hiding in other areas within each apartment. Attempts were made to account for all 12 mice in each test unit, but that was not always achievable in the approximately 5 minutes spent in each apartment. The goal was to achieve accurate counts and observations with minimal disturbance to the mouse populations in the test apartments.

The trail cameras were utilized to record mouse activity throughout the day and night and maintain a digital record of the activity in each test unit, front and back. The first week video images were recorded and the second week still images were utilized. These images were utilized to provide an activity rating of mouse activity and behavior.

Results & Discussion:

Mouse activity was very evident in each of the six test apartments with visual counts, utilization of food, water, nesting material, harborages and with urine and fecal deposits throughout the apartments. Mice were able to get into closed cabinets and in some cases, climb barriers during the evaluations. The mice were actively moving resources into the "mouse stations" primarily in the front rooms, food and nesting materials were constantly being moved around. During the second week of the evaluations mice began to gnaw on base boards and the Masonite retaining structures, but still remained in the apartments. Most of the mouse activity was in the front rooms of both the treated and control apartments.

The visual mouse counts revealed that mice immediately began to explore the whole apartment and use the "mouse stations" in both locations within each apartment. In the untreated apartments the visual counts demonstrated a fairly even distribution of the mice between the front and back rooms. The mice were counted in all the "mouse stations" as

well as mice outside the stations, but in the rooms. The distribution of mice was approximately 50:50 over the 14-days of the evaluation (Figure 3). An Analysis of Variance (ANOVA) were conducted on the data for week 1 and week 2 separately and revealed that the mice were evenly distributed between the front and back rooms (Table 1) for week 1 and week 2 based on visual counts of the “mouse stations” and rooms. Observations indicated that most of the mouse activity remained in the front room where the mice were acclimated. Bedding material and food were transported from the dishes and stations throughout the front room, but only a small amount of food was transported to the back room. Urine and feces were also concentrated in the front room of the untreated control apartments with far less evidence in the back rooms.

The apartment units where the Bell + Howell Ultrasonic Pest Repellers were placed in the front rooms demonstrated a slightly different mouse distribution pattern from week 1 to week 2. The visual mouse counts showed approximately 70% of the mice in the back room and approximately 30% of the mice remained in the front room where the two repellers were placed in the wall sockets. For the first 5 days the mouse distribution was unequal, but began to equilibrate from day 5 through day 14 to about a 50:50 distribution as was observed in the untreated control units (Figure 4). This distribution suggests that the Bell + Howell Ultrasonic Pest Repellers were influencing mouse distribution for the first week of the evaluation, but not in the second week.

An Analysis of Variance (ANOVA) were conducted on the data for week 1 and revealed that the mice were not evenly distributed between the front and back rooms (Table 2) for week 1 based on visual counts of the “mouse stations” and rooms. Observations indicated that most of the mouse activity remained in the front room where the mice were acclimated. Bedding material and food were transported from the dishes and stations throughout the front room, but only a small amount of food was transported to the back room. Urine and feces were also concentrated in the front room of the Bell + Howell Ultrasonic Pest Repeller treated apartments as was observed in the control apartments, again with far less evidence in the back rooms.

The Analysis of Variance (ANOVA) conducted for the second week of mouse count data in the Bell + Howell Ultrasonic Pest Repeller treated apartments (Table 2) demonstrated that the mouse distribution was no different between the front and back rooms as was also observed in the control apartments. This distribution suggests that the Bell + Howell Ultrasonic Pest Repellers did not influence mouse distribution for the second week of the evaluation.

The trail cameras from all six test units captured thousands of images on each camera for the 14-day duration of these evaluations. The cameras showed extensive mouse activity in all six test apartments. The amount of data accumulated is enormous and has not been thoroughly analyzed at this point. Images show mice in the open room entering and leaving the “mouse stations”, feeding and drinking water, moving resources and videos capture mice running, hopping and chasing each other. The behaviors appear to be normal mouse activity in both the Bell + Howell Ultrasonic Pest Repeller treated apartments and the untreated apartments. Several images captured mice investigating the Bell + Howell Ultrasonic Pest Repellers and at least one image showed a mouse sitting

on top of the repeller plugged into the wall. Much of the activity appeared to be playful rather than aggressive behavior as the mice moved about in the open areas. There did not appear to be activity or behavioral differences in the mice between the repeller treated apartments and untreated control apartments. These observational data may need further analysis after watching and quantifying the mouse behaviors over the 14-day evaluation; however, this will require many hours of watching and analyzing videos and still images to come to definitive conclusions.

Conclusions:

The Bell + Howell Ultrasonic Pest Repeller model # 50167 had a slight effect on house mouse distribution within treated apartments for the first week of the two-week evaluation. By the second week the mouse distribution was not significantly different between the front and back rooms of the treated apartments and the distribution pattern was similar to the untreated control apartments. Mouse activity and behavior appeared identical between the treated and untreated control apartments demonstrating no discernable differences attributed to the Bell + Howell Ultrasonic Pest Repeller model # 50167 units.

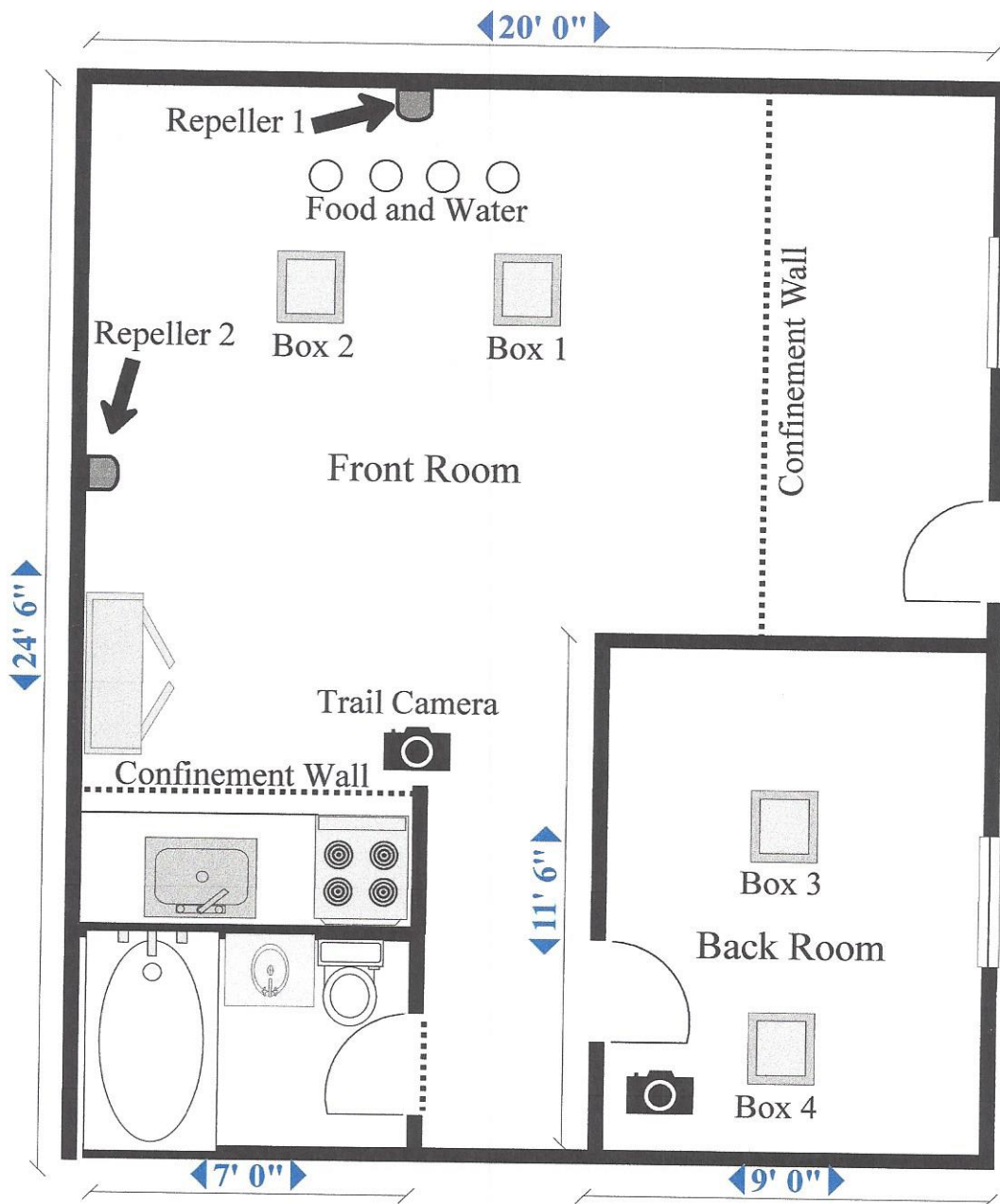


Fig. 1. Floor plan of a 1-bedroom unit at the Suncrest Apartments, Modesto, CA showing modifications made to contain mice and the locations of key elements within the apartments as described in this report.

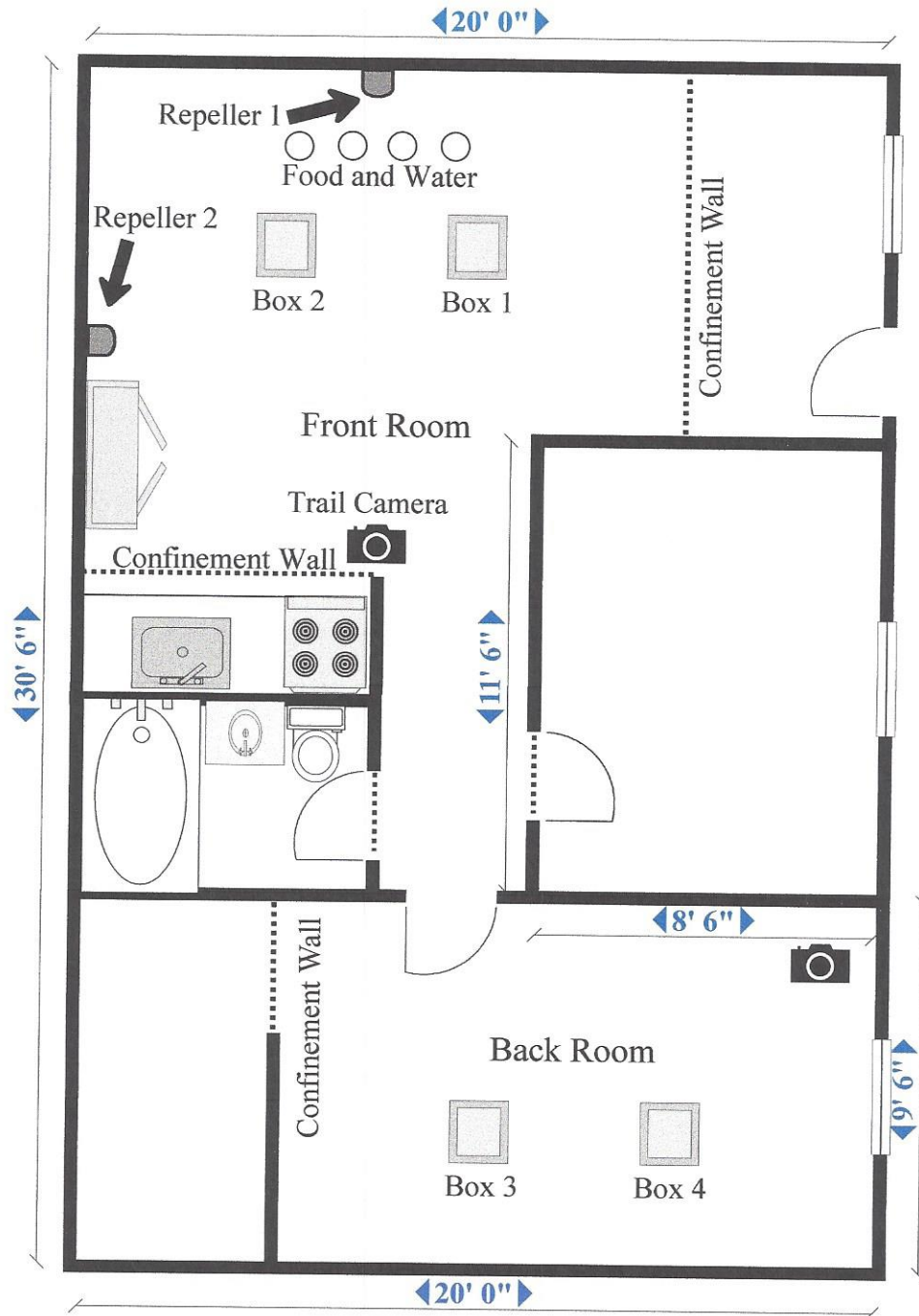


Fig. 2. Floor plan of a 2-bedroom unit at the Suncrest Apartments, Modesto, CA showing modifications made to contain mice and the locations of key elements within the apartments as described in this report.

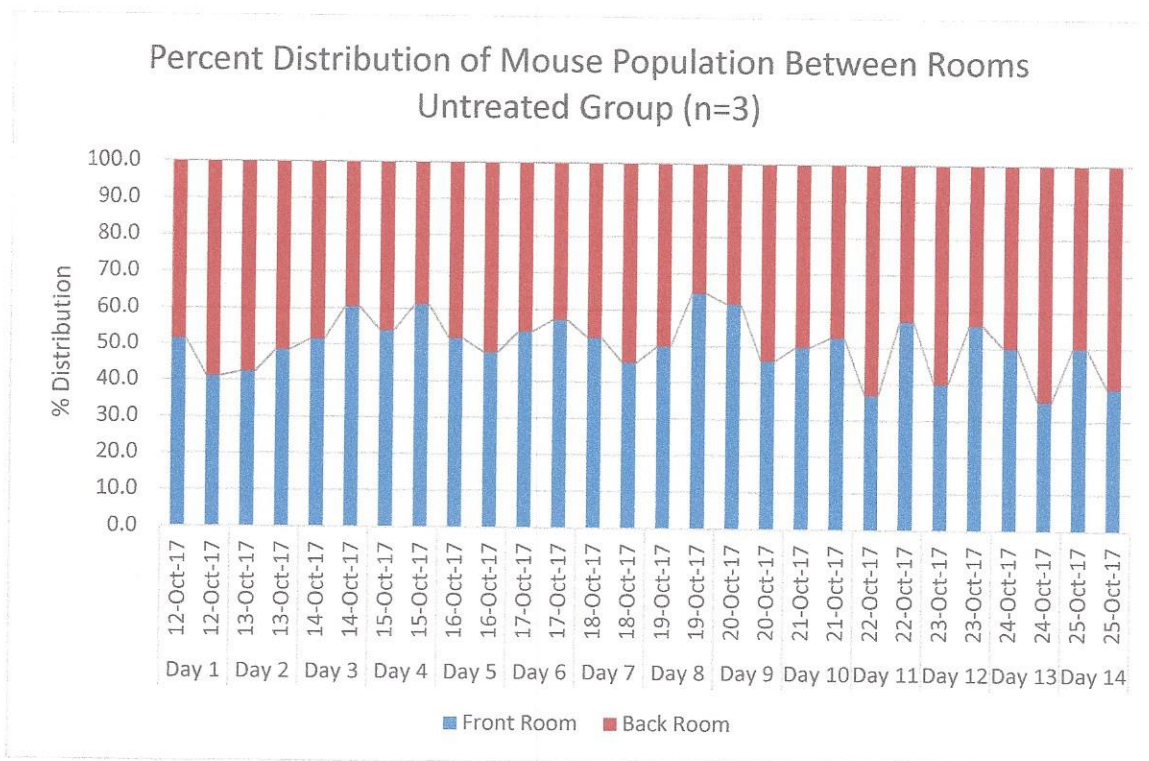


Fig. 3. The average percent mouse distribution between the front and back rooms based on visual counts conducted twice daily for 14-days in untreated control units at the Suncrest Apartments, Modesto, CA

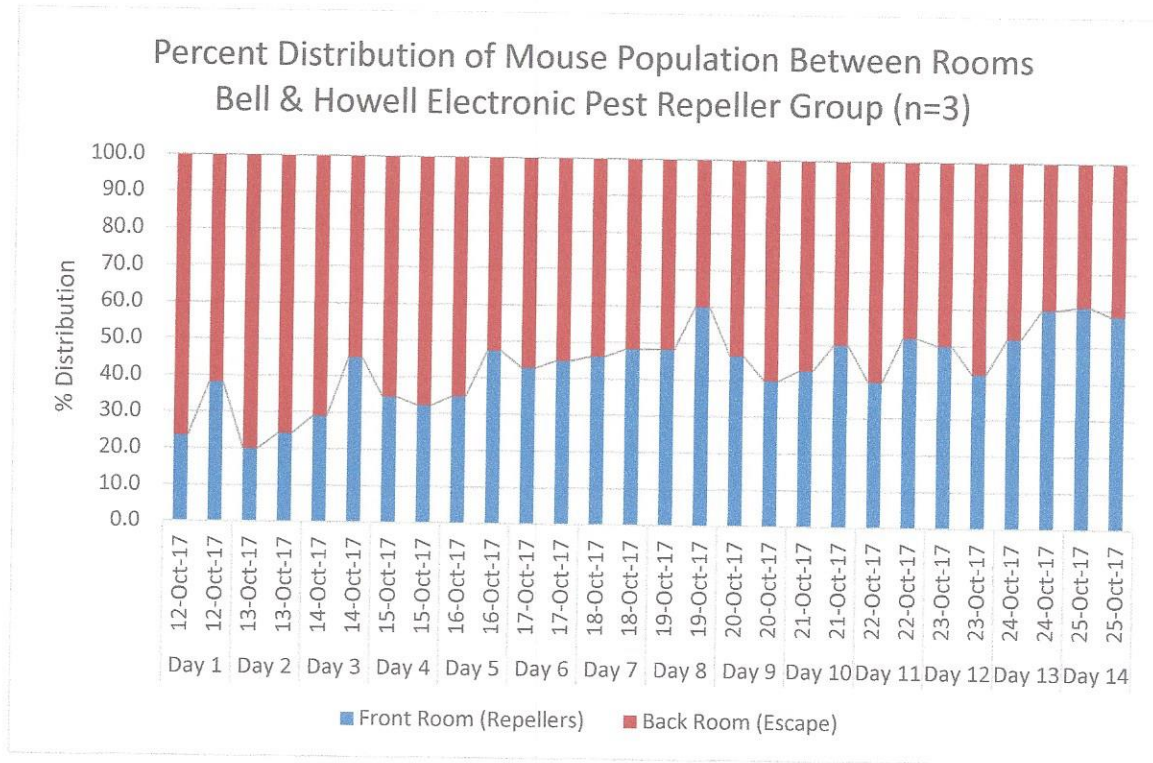


Fig. 4. The average percent mouse distribution between the front and back rooms based on visual counts conducted twice daily for 14-days in untreated control units at the Suncrest Apartments, Modesto, CA

Table 1. Analysis of Variance (ANOVA, Excel) for the average percent mouse distribution between the front and back rooms based on visual counts conducted twice daily for 14-days in untreated control units at the Suncrest Apartments, Modesto, CAAnova: Single
Factor**SUMMARY - UNTREATED GROUP WEEK 1**

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Front Room	14	205	14.64286	8.093407
Back Room	14	195	13.92857	10.07143

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	3.571429	1	3.571429	0.393224	0.536078	4.225201
Within Groups	236.1429	26	9.082418			
Total	239.7143	27				

Result - Accept Null (Populations Equal)**SUMMARY - UNTREATED GROUP WEEK 2**

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Front Room	14	134	9.571429	5.956044
Back Room	14	138	9.857143	6.131868

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.571429	1	0.571429	0.094545	0.760926	4.225201
Within Groups	157.1429	26	6.043956			
Total	157.7143	27				

Result - Accept Null (Populations Equal)

Table 2. Analysis of Variance (ANOVA, Excel) for the average percent mouse distribution between the front and back rooms based on visual counts conducted twice daily for 14-days in untreated control units at the Suncrest Apartments, Modesto, CA

Anova: Single Factor

SUMMARY - TREATED GROUP WEEK 1

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Front Room	14	157	11.21429	10.7967
Back Room	14	276	19.71429	19.91209

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	505.75	1	505.75	32.93845	4.84E-06	4.225201
Within Groups	399.2143	26	15.3544			
Total	904.9643	27				

Result - Reject Null (Populations Unequal)**SUMMARY - TREATED GROUP WEEK 2**

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Front Room	14	171	12.21429	3.565934
Back Room	14	172	12.28571	8.527473

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.035714	1	0.035714	0.005906	0.939329	4.225201
Within Groups	157.2143	26	6.046703			
Total	157.25	27				

Result - Accept Null (Populations Equal)

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Supplemental Pictures



Fig. 1. Intial setup of Mouse Repeller study. Mouse stations consisting of Multiplex® bait stations contained within cardboard boxes with entry ports cut to allow access, untreated apartment.

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Supplemental Pictures



Fig. 2. Intial setup of Mouse Repeller study. Mouse stations consisting of Multiplex® bait stations contained within cardboard boxes with entry ports cut to allow access. Treated apartment with Bell & Howell® Ultrasonic Pest Repellers (2).

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Supplemental Pictures



Fig. 3. Deconstructed mouse station showing Multiplex® bait station nested within a cardboard box. Food and water only provided in food dishes at top of picture. Food in mouse station moved there by mice during duration of study.

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Supplemental Pictures



Fig. 4. Example of interior of Multiplex® bait station nesting boxes with pine shavings and cotton balls. Mice brought food in from exterior food dishes.

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Supplemental Pictures



Fig. 5. Example of mice in kitchen cabinet with an activated Bell & Howell® Ultrasonic Pest Repeller approximately seven days after activation of device.

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Fig. 6. Video still of mouse activity with and activated Bell & Howell® Ultrasonic Pest Repeller showing mouse in mouse station and an individual on the repeller itself (Test Day 7).

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Supplemental Pictures

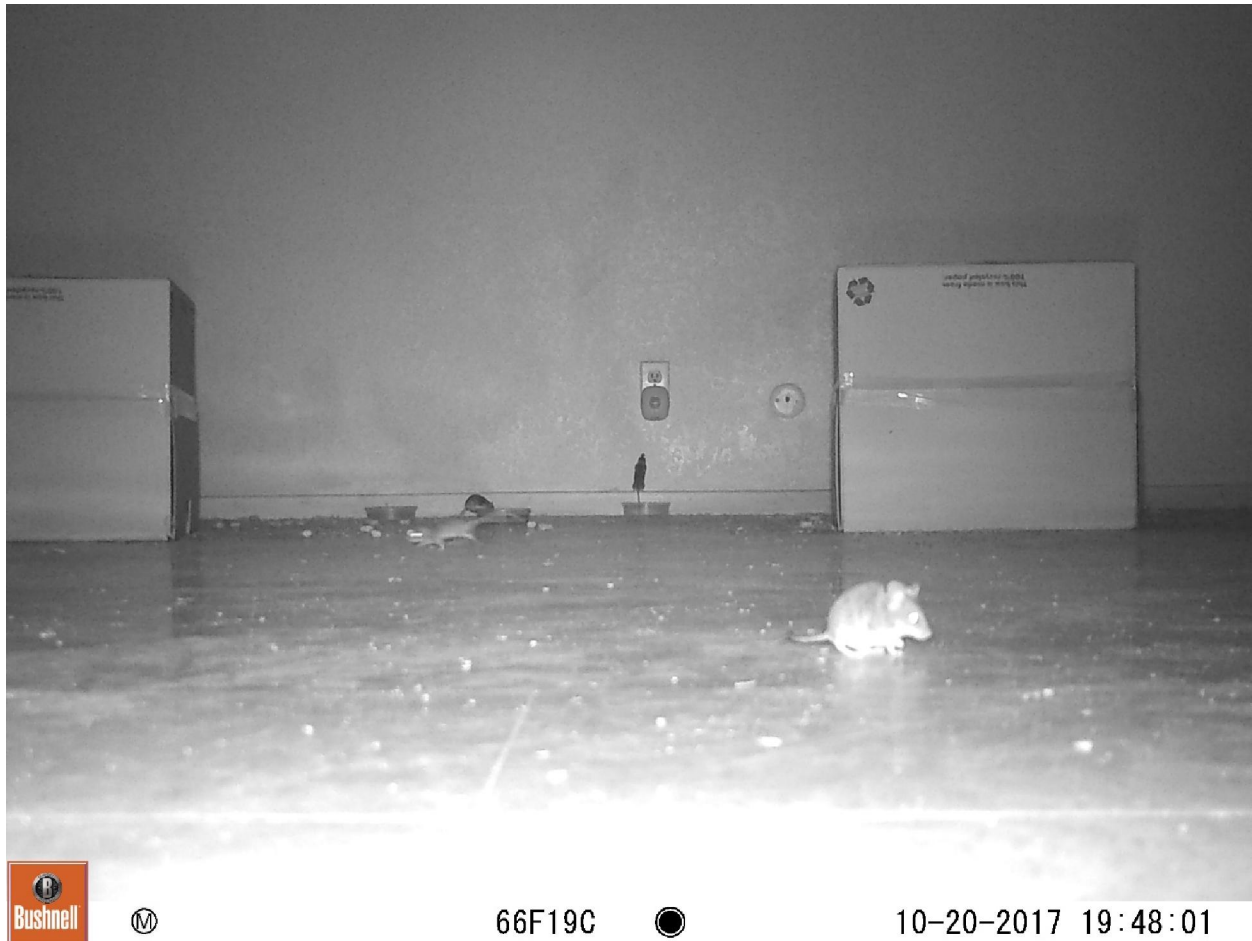


Fig. 7. Still image of mouse activity in an apartment unit with activated Bell & Howell® Ultrasonic Pest Repellers (2). Picture taken on Test Day 9 after initial activation of devices.